GA 1.13: EMD-81-108

BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Better Oversight Needed For Safety And Health Activities At DOE's Nuclear Facilities

Major changes are required in the safety and health oversight program at the Department of Energy's (DOE's) contractor-operated nuclear facilities to ensure that safety, health, and environmental standards are met. This responsibility falls to the operating contractors, which are also responsible for meeting production or program objectives. As a result, safety and health concerns must often compete with program goals.

GAO recommends a major reorganization of DOE's safety and health program as well as other actions to correct program deficiencies. GAO also suggests that the Congress consider legislation to require the Nuclear Regulatory Commission to review the safety of several DOE nuclear facilities.

EMD-81-108
AUGUST 4, 1981

Request for copies of GAO reports should be sent to:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are $3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are $1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-199279

To the President of the Senate and the
Speaker of the House of Representatives

This report discusses organizational changes needed to improve the Department of Energy's safety and health oversight program for nuclear facilities. Although this report is being issued to the Congress, it was initiated at the request of Representative Patricia Schroeder, who requested that we not obtain the Department of Energy's comments on our report.

We are sending copies of this report to Congresswoman Schroeder and the Secretary of Energy.

Milton J. Socolar

Acting Comptroller General
of the United States

B

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

BETTER OVERSIGHT NEEDED FOR SAFETY AND HEALTH ACTIVITIES AT DOE'S NUCLEAR FACILITIES

D I G E S T

The Department of Energy (DOE) owns facilities for producing and processing special nuclear and radioactive material, developing and operating research reactors, producing nuclear reactor fuel, developing and fabricating nuclear explosives, managing nuclear wastes, and performing research. Operating these facilities involves some risk of worker injury or death from mechanical operations and industrial hazards--much the same as many other industries do--and from using toxic chemicals and handling radioactive materials. DOE's nuclear facilities, which are operated for DOE by contractors, are exempt from Nuclear Regulatory Commission and Occupational Safety and Health Administration safety and health regulation and oversight. 1/ Although DOE has historically had a good safety record, in terms of occupational injuries and radiation exposures, in the absence of such outside regulation and oversight, it becomes imperative that DOE maintain an aggressive program of monitoring and oversight to identify safety and health program weaknesses and prevent accidents. DOE has established a safety and health oversight program to provide independent, objective oversight of DOE's nuclear facilities; however, the organizational structure of its program inhibits independence and objectivity.

Representative Patricia Schroeder requested that GAO determine if the Nuclear Regulatory Commission or some other form of regulation would be preferable to the DOE oversight program currently in existence for safety and health matters at DOE's nuclear facilities. To determine what arrangement would provide

---

1/Section 202 of the Energy Reorganization Act of 1974 provides an exception to this exclusion. The Nuclear Regulatory Commission has specific authority to license certain commercial and long-term, high-level radioactive waste storage activities.

the best safety and health oversight for these facilities, GAO reviewed the four functional program areas (occupational safety, emergency preparedness, facility design safety, and environmental monitoring) and sought to answer the following questions:

--Is DOE's program adequate to assure the employees at DOE's nuclear facilities are provided with safe and healthful working conditions? The short answer is "No." DOE needs to (1) improve its handling of employee complaints and safety and health violations and (2) develop a system for focusing oversight activities on high-risk hazards. GAO recommends that DOE take such action. (See pp. 6 to 13.)

--Is DOE providing adequate emergency preparedness guidance and assuring that DOE facilities are prepared to respond to nuclear accidents? The short answer is "No." DOE has provided limited guidance in this area. Overall, DOE does not know the status of the emergency preparedness programs at its facilities and needs to update their emergency preparedness to the post Three Mile Island state-of-the-art. GAO recommends actions to correct these, as well as several other, aspects of DOE's emergency preparedness program. (See pp. 14 to 27.)

--What actions is DOE taking to assure that its older facilities meet current safety criteria and standards? The short answer is "Very limited, if any." DOE's safety analysis program, designed to provide such assurance, receives relatively low priority and, as such, DOE is not aware of the level of design safety at many nuclear facilities. GAO recommends that DOE take several actions to expedite completion of safety reviews for all nuclear facilities. (See pp. 28 to 35.)

--How does DOE assure itself that information concerning radiological releases from DOE's nuclear facilities is accurate and reliable? GAO's answer is that DOE has little assurance. DOE currently relies heavily on data supplied

by its operating contractors. DOE needs to (1) provide guidance to the contractors to assure monitoring uniformity and (2) use independent monitoring data to verify data reported by the operating contractors. GAO recommends that DOE take such action. (See pp. 36 to 40.)

ALTERNATIVES FOR SAFETY AND HEALTH OVERSIGHT AT DOE'S NUCLEAR FACILITIES

The specific problems noted in DOE's occupational safety, emergency preparedness, facility design safety, and environmental monitoring programs warrant immediate corrective action. Some of these problems can be corrected by improved management techniques and a greater awareness of safety and health oversight. However, the underlying organization problems--a lack of headquarters authority and the decentralized nature of the program--may be the more serious problems over the long term.

GAO believes that several alternatives exist for improving the oversight at DOE's nuclear facilities. These range from reorganizing the entire safety and health function within DOE to having outside agencies provide safety and health oversight. Between these extremes lie various forms of cooperative oversight involving DOE and outside, independent agencies.

Each alternative has its own particular advantages and disadvantages. For example, an alternative advocating independent regulation of DOE's nuclear facilities by an outside agency would provide the surest increase in program independence and uniformity, and in the public's confidence that DOE's facilities are safely operated. Practical concerns, however--such as classification and access to nuclear weapons plants--mitigate the desirability of this alternative at this time.

Another alternative involves the reorganization of the safety and health organization within DOE. This alternative is very practical and does have potential for achieving the desired program

qualities. This alternative would also reduce safety and health competition with program offices and the safety and health organization would have the authority to mandate adherence to policy and standards. GAO, therefore, recommends that the Secretary of Energy elevate the oversight aspects of the headquarters safety and health organization to report, as a staff function, to DOE's Under Secretary.

Major changes are also required in the field/headquarters relationship. The current organization offers great potential for conflict between programmatic and safety and health activities. To increase program uniformity and to isolate field safety and health staff from program activities, DOE should reorganize those field organizations involved in safety and health oversight to report directly, and exclusively, to the elevated safety and health organization at headquarters. (See pp. 41 to 46.)

In response to a high-level DOE study of safety at DOE's nuclear reactors, DOE has plans for establishing a separate reactor safety organization. This organization, however, will be established at the same level as the existing safety and health program. GAO believes that this organization will do little to enhance the independence or authority of DOE's safety and health oversight program.

MATTERS FOR CONSIDERATION BY THE CONGRESS

Most of the problems noted during GAO's review can be corrected by reorganizing DOE's safety and health program and by implementing specific corrective action. One situation noted does not appear to be correctable by these actions, but does seem to be more suited to a cooperative arrangement between the Nuclear Regulatory Commission and DOE. In the past, DOE's efforts in ensuring the safety of its facilities have not been adequate. Of particular concern are those cases where safety analysis reviews have been conducted, but have failed to identify hazards which exist at the facility. A lack of technical expertise by DOE safety and health staff, acknowledged by DOE officials, may have

contributed to the incompleteness of these reviews. As a result, GAO believes that consideration should be given for an independent technical review of DOE's safety analysis program for nuclear facilities. Although such a review will undoubtedly involve the commitment of additional staff and resources, GAO believes that the Congress should consider legislation to require the Nuclear Regulatory Commission to review and evaluate a number and variety of DOE's nuclear facilities and processes, including detailed review of plant operations, the contractor's safety analysis methodology and report, and actions taken to mitigate hazards. This evaluation should also examine the adequacy of DOE's review of the safety analysis document. The Commission should report to the Congress on the results of its review and evaluation within 1 year. (See pp. 45 and 46.) Suggested legislative language to implement this program appears as appendix I of this report.

- - - -

As requested by Congresswoman Schroeder, GAO did not forward a copy of this report to DOE, the Occupational Safety and Health Administration, the Federal Emergency Management Agency, or the Nuclear Regulatory Commission for review and comment. The facts presented in this report were, however, discussed with DOE officials.

Contents

		Page
DIGEST		i
CHAPTER		
1	INTRODUCTION	1
	Organization of DOE's safety and health program	2
	Objectives, scope, and methodology	3
2	OVERSIGHT OF WORKER PROTECTION PROGRAMS NEEDS TO BE INCREASED	6
	DOE responsiveness to employee complaints needs improvement	6
	Safety and health violations should be treated more formally	8
	Systematic identification and elimination of hazards needed	11
	Conclusions and recommendations	12
3	DOE'S RADIOLOGICAL EMERGENCY PREPAREDNESS PROGRAM NEEDS TO BE UPGRADED	14
	Variations in emergency preparedness may impare protection from nuclear accidents	15
	Limited support provided to the Federal Emergency Management Agency	21
	Weaknesses in emergency preparedness have not been corrected	22
	Conclusions and recommendations	26
4	ADDITIONAL EFFORT NEEDED TO ENSURE SAFETY OF DOE'S OLDER NUCLEAR FACILITIES	28
	Many DOE facilities do not have completed safety analyses	28
	Failure to identify and correct hazards	31
	Conclusions and recommendations	34
5	OPPORTUNITIES TO INCREASE RELIABILITY OF RADIOLOGICAL MONITORING PROGRAM	36
	Radiological monitoring could be more uniform	36
	DOE is not always verifying accuracy of radiation data	37
	Conclusions and recommendations	39

CHAPTER		Page
6	CHANGES IN SAFETY AND HEALTH OVERSIGHT FOR DOE'S NUCLEAR FACILITIES CAN INCREASE INDEPENDENCE AND UNIFORMITY	41
	Reorganizing DOE to increase independence would also allow constant oversight	42
	Outside regulation of DOE's nuclear facilities would guarantee independent oversight	43
	Cooperative arrangements may provide program improvement in specific areas	44
	Conclusions and recommendations	44
	Matters for consideration by the Congress	45
APPENDIX		
I	Text of suggested amendments to the Energy Reorganization Act of 1974	47

ABBREVIATIONS

DOE	Department of Energy
ERDA	Energy Research and Development Administration
FEMA	Federal Emergency Management Agency
GAO	General Accounting Office
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration

CHAPTER 1

INTRODUCTION

The Department of Energy is responsible for regulating health and safety programs at DOE-owned, contractor-operated, nuclear facilities. Activities at these facilities include producing and processing special nuclear and radioactive material, developing and operating research reactors, producing nuclear reactor fuel, developing and fabricating nuclear explosives, managing nuclear waste, and performing research. Operating these facilities involves some risk of worker injury or death from mechanical operations and industrial hazards, much the same as many other industries do. In addition, DOE's nuclear operations involve some risk to workers and the public from toxic chemicals and radiation.

In the private sector, regulation of worker and public safety and health programs at nuclear facilities is the responsibility of either the Nuclear Regulatory Commission (NRC), the Occupational Safety and Health Administration (OSHA), State agencies, or a combination of these agencies. These agencies do not regulate DOE-owned, contractor-operated facilities because of the following:

--Section 110(a) of the Atomic Energy Act (42 U.S.C. 2140(a)) excludes DOE-owned, contractor-operated facilities from NRC licensing requirements. 1/

--The Occupational Safety and Health Act of 1970 does not apply to employees whose working conditions are regulated by other Federal agencies pursuant to statutory authority (29 U.S.C. 653 (b)(1)). In 1974, OSHA agreed that the Atomic Energy Commission had such authority under the Atomic Energy Act of 1954 and was not subject to OSHA oversight.

--The various State agencies generally derive their authority from NRC and OSHA legislation and consequently have no jurisdiction over DOE's nuclear facilities.

1/Section 202 of the Energy Reorganization Act of 1974 provides an exception to this exclusion. NRC has specific authority to license certain DOE demonstration reactors and high-level radioactive waste storage activities.

Although DOE has historically had a good safety record, in terms of occupational injuries and radiation exposures, in the absence of outside regulation and oversight, it becomes imperative that DOE--solely responsible for protecting the safety and health of employees, the public, and the environment from the effects of activities at DOE nuclear facilities--maintain an aggressive program of monitoring and oversight to identify program weaknesses and prevent accidents.

ORGANIZATION OF DOE'S SAFETY AND HEALTH PROGRAM

Responsibility for DOE's safety and health program (including emergency preparedness and environmental protection) is divided among three groups--the Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness, DOE's program offices; and DOE's field offices.

At DOE headquarters, the Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness (more specifically, the Division of Operational and Environmental Safety) is responsible for (1) developing program policies, standards, guides, and requirements; (2) providing technical advice and assistance; and (3) serving as a focal point for safety and health protection matters both within DOE and with other departments, agencies, and groups. The Assistant Secretary, however, has no authority over the program or field offices and coordinates with these groups in an advisory capacity only.

DOE's program offices (Defense Programs, Nuclear Energy, Energy Research, etc.) are responsible for implementing the safety and health program at DOE's nuclear facilities and ensuring that all related policies, standards, guides, and regulations are followed. These program offices (which are located primarily at DOE headquarters) have delegated nearly all these responsibilities to DOE's field offices.

DOE's field offices--eight operations offices and a number of subordinate area offices--are ultimately responsible for ensuring that contractors operate DOE's nuclear facilities safely. Consequently, each field office has a safety and health staff responsible for overseeing the activities of the facilities and guaranteeing that both the public and workers are adequately protected from radiological and other hazards.

Safety and health staff in the field are independent of direct authority from the program offices, and the Assistant Secretary for Environmental Protection, Safety, and Emergency

Preparedness, report instead--in some cases directly, in some cases indirectly--to the operations office manager. This manager reports to DOE's Under Secretary. 1/

OBJECTIVES, SCOPE, AND METHODOLOGY

This review of DOE's environmental protection, safety, health, and emergency preparedness programs for nuclear facilities was performed at the request of Congresswoman Patricia Schroeder. The request specifically asked us to determine (1) if NRC should have oversight or regulatory role over DOE's nuclear facilities and (2) if such oversight or regulatory role is undesirable, what other options are available to ensure the adequate separation of nuclear research, development, and weapons production activities from health, safety, and environmental oversight.

To determine if NRC should assume some oversight or regulatory role over DOE nuclear facilities, or if some other internal or external alternatives are available to increase program independence and objectivity, we sought first to determine the extent and adequacy of DOE's safety and health program. Once we established a perspective on the quality of DOE's safety and health oversight, we determined the advantages and disadvantages of alternative forms and sources of oversight.

In a prior report ("Department of Energy's Safety and Health Program for Enrichment Plant Workers Is not Adequately Implemented," EMD-80-78, July 11, 1980) we provided some insight into DOE's occupational safety and health program at three DOE-owned gaseous diffusion enrichment facilities and one operations office. We reported that while the program appeared to be adequately designed, implementation of oversight activities by DOE was lacking.

That review, however, provided only a limited insight into the broad range of activities comprising DOE's safety and health program. Overall, DOE's program consists primarily of four major functional areas--occupational safety and health, emergency preparedness, facility design safety, and environmental monitoring. Occupational safety was reviewed to determine if DOE's program is adequate to ensure that employees at DOE's nuclear facilities are provided with safe and healthful working conditions. DOE's emergency preparedness program was reviewed to ascertain if DOE is providing adequate guidance and ensuring that its nuclear facilities are prepared to respond to nuclear accidents. We reviewed DOE's facility design safety program to determine what actions DOE is taking to ensure that its older nuclear facilities meet current

---

1/GAO plans to issue a report addressing DOE's headquarters/field organization structure.

safety criteria and standards. In the area of environmental monitoring, we focused on how DOE ensures that information concerning radiological releases from its nuclear facilities is accurate and reliable.

These four areas were chosen for review because they all directly affect the health and safety of workers and the public. In addition, emergency preparedness was chosen to ascertain what actions DOE has taken to implement the recommendations made in our 1979 report 1/ and to implement the emergency preparedness lessons learned from the Three Mile Island accident.

The majority of our review work for all four safety and health functional areas was performed at DOE headquarters in Washington, D.C., and DOE's Albuquerque (New Mexico), Richland (Washington), and Savannah River (South Carolina) Operations Offices. Review of reports, policies, guidance, and requirements and discussions with DOE officials within the headquarters offices of the Assistant Secretary for Defense Programs and the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness enabled us to gain a perspective of the overall program goals and objectives and the organization of the program. DOE's Albuquerque, Richland, and Savannah River Operations Offices were chosen because they are responsible for many of DOE's most critical nuclear facilities and are among the largest of DOE's operations offices. Review of complaint procedures and files, exposure records, facility safety analysis, environmental reports, appraisals, inspection reports, emergency drill critiques, procedures, guidance and other documents, and discussions with DOE officials at the Savannah River Operations Office provided information on program implementation at DOE's Savannah River facility in Aiken, South Carolina. Similar work at the Albuquerque Operations Office provided information on the Pantex Plant (Amarillo, Texas), Mound Facility (Miamisburg, Ohio), Kansas City Plant (Kansas City, Missouri), Los Alamos Scientific Laboratory (Los Alamos, New Mexico), Pinellas Plant (Pinellas, Florida), Rocky Flats Plant (Rocky Flats, Colorado), and Sandia Laboratories (Albuquerque, New Mexico and Livermore, California). Our work at the Richland Operations Office provided information related to the four major contractors operating facilities on the Hanford (State of Washington) reservation. 2/

1/U.S. General Accounting Office, "Areas Around Nuclear Facilities Should Be Better Prepared for Radiological Emergencies," EMD-78-110, Mar. 30, 1979.

2/While the locations listed do not represent all contractors operating under the three operations offices, they do comprise all the major operating contractors and facilities.

To obtain more detailed information concerning several of the facilities, we (1) also reviewed similar documents and held discussions with DOE officials from DOE's Rocky Flats, Amarillo, Dayton (Ohio), and Sandia (New Mexico), area offices and (2) talked with contractor and labor union officials, reviewed documents, and viewed plant conditions at Sandia Laboratories, the Savannah River Plant, the Rocky Flats facility, the Pantex plant, and the four major contractors on the Hanford reservation. These facilities were chosen to provide information on a variety of activities (research, production, storage, etc.) as well as materials (uranium, plutonium, etc.).

To provide a basis for comparing DOE's program with that which could be provided by an independent agency, our review also included reviewing documents and holding discussions with officials at NRC and OSHA. Where appropriate, OSHA and/or NRC program criteria were used as a comparison to DOE's efforts, although no effort was made to evaluate OSHA or NRC criteria or their programs. In addition, to evaluate DOE's support of the Federal Emergency Management Agency (FEMA), we reviewed FEMA policies and guidance and held discussions with FEMA officials concerning their coordination with DOE.

It should be noted that, subsequent to the start of our review work, DOE's Office of the Inspector General began a review with similar objectives. Contact, for coordination purposes, has been maintained with the Office of the Inspector General throughout our review. The Inspector General's report is anticipated later this year.

CHAPTER 2

OVERSIGHT OF WORKER PROTECTION PROGRAMS NEEDS TO BE INCREASED

If DOE's nuclear facilities were privately owned and operated, they would be regulated by NRC for radiological matters, and by OSHA for non-radiological safety and health concerns. Because DOE is exempt from such regulation, it must guarantee that each of its facilities operate in a manner which protects the public and workers' safety and health.

DOE records of occupational injuries and exposures at nuclear facilities indicate that relatively few individuals have been injured or received exposures exceeding DOE's internal and external radiation standards. 1/ DOE appears, however, to rely almost solely on contractors to resolve complaint and correct safety and health violations, with little or no DOE oversight. DOE oversight efforts are not sufficient to guarantee that a contractor will continue to operate the facilities in a manner which provides safe and healthful working conditions. To provide such oversight, DOE needs to (1) be more responsive to employee complaints which may identify serious safety and health hazards; (2) treat safety or health violations in a more formal, uniform manner, including posting citations, setting time limits on corrective actions and following up to ensure prompt correction; and (3) systematically make use of available information to ensure that the most serious hazards are identified and eliminated before injury or exposure occurs.

DOE RESPONSIVENESS TO EMPLOYEE COMPLAINTS NEEDS IMPROVEMENT

In the private sector, OSHA gives employee complaints high priority among their activities, secondary only to imminent danger investigations and investigations of catastrophic or fatal accidents. Complaints may serve to identify safety or health hazards and also provide a form of appeal once an employee has failed to obtain resolution with the contractor.

DOE's procedures for handling employee complaints tend to encourage contractor employees to resolve their safety or health problems through the contractor's complaint procedures. If the

---

1/DOE's annual dose standard has been derived from dose levels recommended by the National Committee on Radiation Protection and Measurements and the International Commission on Radiological Protection.

complaint cannot be resolved at this level or if, for some reason (such as desiring anonymity), the employee does not wish to complain to the contractor, the employee may file a written or verbal complaint with DOE. Complaints involving imminent danger--threatening death or serious physical harm--should be dealt with immediately DOE procedures provide that all other complaints are to be reviewed and, if determined necessary by a DOE official, an inspection should be made of the area of the complaint within 15 days. When the complainant has identified himself or herself, DOE is required to prepare a written response notifying the complainant of the results of the DOE inspection or state why no inspection was made. Complaints are usually handled by DOE field offices.

DOE however, is not resolving complaints in accordance with these procedures. Instead, DOE is relying extensively on the operating contractors to resolve serious complaints which have been submitted to DOE, even when the employee desires anonymity. In addition, DOE is not being responsive to the actual issue of the complaint nor is it always viewing complaints as a source of valuable information about potential hazards. For example, on June 9, 1980, an employee at DOE's Rocky Flats facility noted an improperly installed filter on a glove box. 1/ The employee reported this to his supervisor. On June 12, the area around the glove box was checked and found to be contaminated. Respirator protection was immediately prescribed for the area, and that specific glove box was shut down.

The employee filed a complaint which stated that the contaminated condition existed for 3 days after discovery because the supervisor did not want to disrupt production to correct the problem. Although the complaint focuses on a serious allegation that hazardous conditions were knowingly allowed to exist to facilitate production, DOE's Rocky Flats Area Office did not investigate this issue. The complainant received a response from DOE 23 days later, informing him that DOE could not substantiate his allegation and that safety was the responsibility of the operating contractor.

Another Rocky Flats complaint also involved glove box operations. On August 5, 1980, 4 days after a contamination incident, a complaint was filed alleging that workers performing certain glove box operations were routinely exposed to air contaminated with radioactivity in excess of allowable standards. DOE did not investigate the complaint. However, DOE had received a copy of

---

1/A glove box is a sealed box in which workers, using gloves attached to and passing through openings in the box, can handle radioactive materials safety from the outside.

the contractor's investigation of the August 1, 1980, incident which documented at least 14 incidents of contaminated air in that specific work area. DOE did not mention this to the complainant, and the response stated only that although there were some deficiencies, the containment system and procedures were adequate to ensure the safety and health of individuals.

Although both of the examples cited occurred at the Rocky Flats plant, such treatment of complaints is not unique to a particular DOE field office and occurred at almost all locations included in our review.

SAFETY AND HEALTH VIOLATIONS SHOULD BE TREATED MORE FORMALLY

OSHA requires inspectors to classify safety or health violations noted during workplace inspections. These classifications help categorize the relative seriousness of the violation and assign appropriate time limits, or abatement dates, for corrective action and penalties. For violations classified in the more serious categories, OSHA follows up to ensure abatement. All OSHA citations of violations are posted in the workplace to inform employees of potential hazards.

DOE periodically performs OSHA-type inspections, but does not always post citations, set abatement dates, or follow up to ensure abatement. A formal violation classification system such as OSHA's could help ensure that more serious hazards receive the most attention and are corrected on a prioritized basis. In addition, DOE, at times, notes safety and health violations during oversight activities other than OSHA-type inspections. Because they are not found during a formal inspection, however, these violations are not treated as violations, and are handled informally. Employees are not notified, abatement dates are not usually set, and followup to ensure abatement is not performed.

Failure to classify violations minimizes significance of hazards

OSHA classifies safety and health standards into three major categories: "de minimis," other than serious violations, and serious violations. De minimis violations are rarely used, but refer to violations having no bearing on worker safety and health, such as failure to comply with OSHA records requirements. Other than serious violations are those which have a direct relationship to job safety and health, but would not cause death or serious physical harm. Serious violations are those which have a substantial probability that death or serious physical harm could result. OSHA sets abatement dates for all three types of violations. Followup inspections are mandatory for serious violations, and abatement dates for serious violations are usually shorter than for other violations.

DOE has no overall policy concerning the classification and treatment of violations. Thus, DOE has no requirements regarding abatement timeframes or followup inspections to ensure correction. The DOE field offices we visited either made no distinction between types of violations or used only two categories, "de minimis" and "violations." We do not believe this provides adequate assurance that serious hazards will be promptly abated. For example, at DOE's Richland Operations Office, the operating contractor was cited for violations of standards requiring guards on cutting equipment. This violation meets OSHA's criteria for a serious violation. Two months later, the contractor reported to DOE that guards had been installed, but DOE did not conduct a followup inspection to ensure abatement. Under OSHA jurisdiction, a followup inspection would have been mandatory.

While OSHA rarely uses the de minimis classification, our review showed that DOE has used de minimis improperly to cite violations which may jeopardize worker safety and health. For example, the Richland Operations Office cited de minimis violations of standards for storage of acids, blocked fire exits, and requirements for emergency equipment such as chlorine masks and stretchers. The Savannah River Operations Office similarly classified the failure to label flammable liquids as de minimis violations. While not being in a category of threatening life, these violations have potential serious impacts on the safety and health of workers. In addition, the Savannah River and Richland Operations Offices do not require contractors to post citations of de minimis violations in the workplace, and Richland does not set abatement dates for de minimis violations.

Seriousness of violations noted during non-OSHA-type compliance activities minimized

OSHA inspectors are required to formally cite and post violations, regardless of the type of oversight activity being conducted. DOE conducts many oversight activities other than OSHA-type inspections. DOE may note safety and health violations during appraisals of contractors' safety and health programs, complaint and accident inspections, or informal workplace visits. DOE has, however, no overall procedures for dealing with violations of safety and health standards which are found during these other oversight activities. DOE's field offices, therefore, have each developed and adopted their own set of procedures for dealing with violations noted during appraisals, informal workplace inspections, and complaint or accident investigations.

When serious violations of safety or health standards are noted by DOE during non-OSHA-type monitoring activities, a letter or memo is usually sent to the contractor pointing out safety or health violations, but citations are not posted in the

workplace. DOE sometimes requires the contractor to prepare a formal response indicating the actions that will be taken to correct the violations. The abatement time frame, however, as with the formal OSHA-type inspection citation, is usually left to the discretion of the operating contractor.

If a formal OSHA-type citation were issued for such violations, DOE would be responsible for posting the citation in the workplace for 3 days or until all violations are corrected, whichever is longer. A primary purpose of posting citations in the workplace is to advise workers of the potential hazards. Informal treatment of violations, therefore, does not provide the same degree of worker protection embodied in the formal procedures used for OSHA-type compliance inspections. While DOE's informal treatment of violations is a quick administrative solution for promptly advising the contractor of hazards, it does not provide the needed assurance that violations are promptly and adequate abated.

For example, at DOE's Richland Operations Office, the DOE safety and health staff has developed a rather informal walk-through inspection program for contractor facilities. These inspections are scheduled in advance with the various contractors at Hanford. During the past 3 years, several hundred such inspections were performed by the Richland Operations Office safety and health staff, compared to 14 OSHA-type compliance inspections. Violations of safety and health standards were noted during many of these facility inspections. In most cases, the DOE safety and health staff prepared a handwritten summary of violations noted and provided a copy of the summary to the operating contractor. These violations were not posted and, in many cases, correction of the violations was left to the contractor with no documented feedback or followup by the DOE safety and health staff to determine whether the violations were promptly and adequately abated.

In one instance, during a November 1978 informal facility inspection of a waste encapsulation and storage plant, DOE's Richland Operations Office safety and health staff identified a hazardous condition. Several sump alarms 1/ were not operational--either turned off or silenced due to water in the sump.

The problem was brought to the attention of the operating contractor in November 1978, but a violation was not formally cited or posted. In January 1979, DOE again observed that four alarms were not operational, and the matter was brought to the attention of the responsible DOE program division and a contractor representatives. DOE did not set abatement dates or post a notice of the violation, but indicated that corrective action is the responsibility of the DOE program division and the operating contractor.

1/Sump alarms are designed to alert operating personnel to the presence of radioactive water before it can flood nearby work areas.

In late April 1979, DOE observed inoperable alarms and determined that no apparent corrective action had been taken by the contractor. DOE program personnel and the contractor were again advised of the problem. In November 1979, a year after the original notification, the problem had still not been corrected and resulted in the undetected leakage of contaminated water to the area outside the cell area. In February 1980, the contractor finally took action to correct the situation.

SYSTEMATIC IDENTIFICATION AND ELIMINATION OF HAZARDS NEEDED

In addition to investigating accidents and complaints, OSHA conducts programmed inspections of various facilities in the private sector. Facilities to be inspected are selected based on death, injury, and illness incidence rates, and the nature of the facility--that is, industries which expose workers to serious hazards are the most likely to be selected.

DOE has information available which may indicate where the most serious hazards exist. Trend analysis of prior appraisals, OSHA-type inspections, informal inspections, complaints, accidents, and unusual occurence reports 1/ all may indicate the areas with the most potential for causing employee injury or illness. DOE has not analyzed this information, however, and has little assurance that oversight activities are targeted at the higher risk areas. For example, asbestos products have been widely used in existing nuclear facilities at DOE's Hanford complex. Demolition, modification, removal, or repair of such installations can result in high airborne concentrations of asbestos fibers if proper control procedures are not employed. In addition, normal deterioration and flaking of asbestos products can release asbestos fibers in the air. Asbestos is widely recognized as a severe high-risk health hazard because exposure to asbestos fibers can cause lung cancer.

Our review of the appraisal and inspection records for the past 3 years indicated that asbestos violations were noted during a few workplace inspections conducted by the Richland Operations Office. Samples taken by an industrial hygiene consulting firm in November 1980 indicated that airborne concentrations of asbestos fibers which greatly exceeded DOE's standard (more than 10 times) were present in a workplace during an insulation removal operation being conducted by employees who were not wearing proper protective equipment. The Richland Operations Office has not, however, conducted a comprehensive review of operations involving this hazard, despite its widespread use and severity, and the violations which have been noted during workplace visits.

1/An unusual occurence report is filed whenever any accident occurs at a DOE facility.

If DOE had systematically analyzed this hazard, it might have identified this problem at an earlier date and taken action to mitigate the hazard.

CONCLUSIONS AND RECOMMENDATIONS

In lieu of OSHA oversight of non-radiological and radiological workplace conditions, DOE must ensure that safe and healthful working conditions exist and are maintained at DOE's contractor-operated nuclear facilities. This role places DOE in the awkward position of both operating and regulating its facilities. Certain areas of DOE's oversight appear to be suffering from that apparent conflict and should be improved to ensure that workers at DOE's nuclear plants are provided with better protection from safety and health hazards.

DOE's complaint process often does not offer employees an independent and objective source of complaint resolution. DOE's handling of complaints places too much reliance on the operating contractor and is often not responsive to the complainant.

DOE currently does not have a system for classifying safety and health violations according to the degree of hazard involved. In addition, DOE has not treated violations noted during oversight activities, other than OSHA-type inspections, in a formal manner. Informal treatment of violations tends to minimize the seriousness of violations and does little to ensure employee awareness of hazards and prompt correction of the violations. DOE's current treatment of violations does not always provide adequate employee protection.

In addition, DOE does not have a systematic method of analyzing hazard information (readily available from accident reports, safety analysis documents, unusual occurence reports, or complaints) to ensure that oversight priorities are correctly established and that hazards are eliminated, and radiation exposures and injuries are maintained as low as reasonably achievable.

We perceive no difference between the level of safety which should be provided for workers in private industries and DOE nuclear facilities. As a minimum, DOE should use OSHA criteria as a basis for its safety and health oversight activities. Therefore, to improve DOE's oversight of occupational safety and health programs at DOE's nuclear facilities we recommend that the Secretary of Energy:

--Require, for a potentially serious safety or health complaint which cannot be adequately resolved at the contractor level, that DOE safety and health officials conduct an independent investigation and provide to the complaintant a response which clearly addresses the issues of the complaint and provides data clearly supportive of DOE's findings or opinions.

--Take action to develop a uniform policy for dealing with safety and health violations. This policy should include a system to delineate classes of violations based on danger to employees as well as requirements for posting violations, setting abatement timeframes, and checking to ensure that corrective action has been taken.

--Direct that a formal, consolidated system be established to collect and analyze information on workplace hazards for all DOE nuclear facilities and establish priorities for future safety and health oversight activities based on that analysis.

CHAPTER 3

DOE'S RADIOLOGICAL EMERGENCY PREPAREDNESS PROGRAM NEEDS TO BE UPGRADED

The greatest danger from a nuclear accident is the release of significant amounts of radioactive material into the environment. To minimize the potential health and safety impact of such releases, DOE must plan and prepare for radiological emergencies. DOE requires each nuclear facility operator to develop a program to protect people, property, and the environment from radiological emergencies. These programs, however, only cover onsite protective actions. When releases go beyond the site boundary, DOE's role is limited to (1) notifying State and local agencies of potential offsite releases; (2) providing assessments of the offsite hazard; and (3) recommending protective measures, such as evacuation. If requested, DOE facilities are also prepared to provide off-site radiological monitoring assitance but, for the most part, offsite protective measures are the responsibility of State and local governments.

The Three Mile Island nuclear power plant accident has prompted a major rethinking of the whole area of radiological emergency planning and preparedness. This accident revealed that interaction among the various emergency organizations in developing, reviewing, and testing emergency plans was insufficient to ensure an adequate level of preparedness for a serious radiological accident. Responding to lessons learned from Three Mile Island, the President (by Executive Order 12148) directed FEMA to coordinate offsite radiological emergency preparedness around nuclear facilities, including DOE nuclear facilities.

Our study, therefore, concentrated on DOE's planning and preparedness activities for emergencies involving offsite releases. More specifically, we reviewed DOE's program to ensure that its nuclear facilities are prepared to deal with radiological emergencies, primarily those involving off-site releases. In addition, in March 1979, we reported on specific weaknesses in DOE's emergency preparedness program. This chapter also discusses the status of DOE actions to correct those weaknesses.

We found that DOE's radiological emergency preparedness program has not received sufficient priority and, in the event of an accident at a nuclear facility, may not be prepared to adequately protect the public, the environment, and property from the effects of a radiological release. Responsibilities are fragmented throughout DOE, and limited headquarters' guidance has caused a general atmosphere of confusion as to the roles and responsibilities of DOE organizations.

Specifically,

--emergency preparedness programs vary among DOE field offices and improvements are needed to provide more effective oversight of emergency preparedness activities,

--DOE is providing limited support for FEMA's efforts to upgrade radiological emergency preparedness nationwide, and

--weaknesses identified in GAO's March 1979 report have not been corrected.

VARIATIONS IN EMERGENCY PREPAREDNESS MAY IMPAIR PROTECTION FROM NUCLEAR ACCIDENTS

The scope of emergency preparedness programs and the priority assigned emergency preparedness activities vary considerably from one field office to another. Although management at all field offices informed us that emergency preparedness is important, some appeared better prepared to respond to emergencies than others.

Actions since the Three Mile Island accident provide some insight into the extremes in field office emphasis on emergency preparedness. For example, the Richland Operations Office has been aggressively upgrading its emergency preparedness program by

--improving field office and contractor capabilities to respond to accidents involving releases going beyond the site boundary,

--working closely with the State and county governments and the local public power supply system to integrate emergency plans, and

--adapting planning criteria established jointly by FEMA and NRC for developing and evaluating emergency response plans for commercial nuclear powerplants.

Richland's actions are independent of any DOE-wide requirements. Richland management informed us that needed improvements are too important to wait for DOE headquarters to issue guidance.

Savannah River Operations Office officials, on the other hand, are aware that the Three Mile Island accident emphasized the need for clear, concise procedures for offsite alerts and notification to local government officials and the general public. Savannah River's procedures, however, date back to 1974 and do not include notifying local government agencies of events during an accident. The Savannah River Operations Office has evaluated its offsite warning system for contacting local government agencies and communicating accident information to people living in nearby communities. Although Operations Office officials concluded that the

system needs to be upgraded, management officials have deferred action in this area until DOE headquarters issues specific planning criteria.

Finally, we found little change in either the scope or attitude towards emergency preparedness at the Albuquerque Operations Office. Officials at the Albuquerque Operations Office stated that the accident at Three Mile Island has not changed what they do--it just increased the amount of paperwork:

Several factors contribute to this wide variability among field office and contractor emergency preparedness programs:

--The lack of a strong, centrally managed emergency preparedness program at headquarters serves to dilute the importance of emergency preparedness throughout the organization.

--Headquarters' failure to issue policy directives further downgrades its importance.

--Lack of aggressive oversight by DOE through its appraisal program and evaluation of contractor drills does not ensure contractor emergency preparedness programs are in place and working.

Centralized, coordinated emergency preparedness program needed at DOE headquarters

A coordinated, unified approach to emergency preparedness would help DOE ensure that its emergency preparedness needs are being met. More specifically, it would provide a focal point for all emergency preparedness activities, ensure clear assignments of responsibility among its many program and field offices, and aid in identifying overlaps and gaps in emergency preparedness programs. Without this type of strong, centralized management, however, each facility is relatively free to determine its own level of emergency preparedness capability. The result may be less than that needed to sufficiently protect people, property, and the environment. The level of emergency preparedness required should be a policy decision uniform throughout DOE, not an operational decision to be left to the field offices or the operating contractors.

As currently exists, radiological emergency preparedness functions at DOE headquarters are primarily divided among three organizations. Two of these organizations--the Division of Military Applications and the Office of Safeguards and Security--are aligned under DOE's Assistant Secretary for Defense Programs. The third organization--the Division of Operational and Environmental Safety--reports to DOE's Assistant Secretary for Environmental Protection,

Safety and Emergency Preparedness. Each group is responsible for planning, organizing, and managing for emergencies as follows:

--The Division of Military Applications is responsible for emergencies involving nuclear weapons.

--The Office of Safeguards and Security is responsible for terrorist-related nuclear emergencies.

--The Division of Operational and Environmental Safety is responsible for accidents arising from DOE operations and natural phenomena emergencies affecting DOE facilities.

Each organization is also responsible for developing and issuing policy directives in its assigned area of responsibility. Such directives assign responsibilities within DOE and describe implementation methods. In addition, the Division of Operational and Environmental Safety is responsible for appraising field organizations to ensure effective implementation.

The focal point for all DOE emergency preparedness activities, however, is supposed to be the Emergency Coordinator. This official (required by the Federal Preparedness Agency Circular, FPC-10, dated August 20, 1976) is responsible for (1) identifying the need for emergency programs anywhere within DOE; (2) providing planning assistance and guidance to offices developing emergency plans and programs; and (3) generally monitoring, reviewing, and reporting on all such plans and programs. The Emergency Coordinator's responsibilities include all types of emergencies, such as energy shortages, mobilization in the event of war, and radiological emergencies.

Five years after FPC-10 was issued, however, DOE's Emergency Coordinator function is still in its early stages of development. FPC-10 required that the Emergency Coordinator function be assigned at a "sufficient level and scope of authority" to be aware of the emergency needs throughout the organization. Nevertheless, this function is currently being carried out by the Departmental Emergency Preparedness Branch, which is several levels below the Assistant Secretary. Such placement within the organization, we believe, inhibits the ability of the Emergency Coordinator to carry out his responsibilities and also diminishes the perception of the priority assigned to the emergency preparedness function.

In addition, we found that the Emergency Coordinator does not know how well DOE facilities are prepared to respond to radiological emergencies, whether emergency preparedness appraisals are being performed at DOE facilities, or even how often these appraisals should be performed. There have been no emergency preparedness directives issued by the Emergency Coordinator

since DOE's formation and the Coordinator has not developed, nor coordinated the development of, radiological emergency preparedness standards, procedures, guides, or criteria.

Emergency planning directives and guidance are needed

Departmental policy directives for emergency preparedness should clearly define the roles and responsibilities of DOE headquarters organizations, field offices, and operating contractors. In addition, these directives should clearly define specific requirements necessary for an effective emergency preparedness program and plans. Without such requirements, emergency preparedness programs vary, and facilities may not be adequately prepared to respond to emergencies.

Assignments of emergency preparedness functions and responsibilities within DOE are not clearly defined. More importantly, certain gaps in DOE policies, procedures, and assignments of responsibilities for emergency preparedness have caused confusion as to the roles and missions of DOE organizations in this area. The most recent policy directive designating emergency planning function and responsibilities was issued on December 1, 1976, by DOE's predecessor, ERDA. This directive, refered to as ERDA Manual Chapter 0601, "Emergency Planning, Preparedness, and Response Program" describes radiological emergency planning policy objectives, responsibilities, and authorities of ERDA. Upon formation of DOE on October 1, 1977, this directive was cancelled and is only being used as reference and/or guidance until a DOE management directive is issued. Almost 4 years later, DOE has yet to issue a new directive: and, according to a DOE official, yet another year could go by before a DOE emergency planning directive is issued.

All of the field offices we visited expressed frustration over the lack of direction or guidance received from headquarters. Most of the field offices were confused concerning the division of responsibilities at DOE headquarters and did not believe that headquarters gave emergency preparedness a very high priority. Even when field offices requested specific guidance, the headquarters' reply was not always responsive to field office concerns. For example, the Savannah River Operations Office advised the Assistant Secretary for Defense Programs of actions it was taking to enhance emergency preparedness in light of the Three Mile Island accident. This correspondence also pointed out problems Savannah River was experiencing and requested headquarters guidance on the proper role of the field office. Headquarters' response, received from the Assistant Secretary for Environment, complimented the Savannah River Operations Office for its emergency preparedness efforts, but did not address the problem areas identified by Savannah River. Consequently, Savannah River deferred action until more specific headquarters guidance or criteria is developed.

DOE's oversight of emergency preparedness activities needs improving

DOE is responsible for ensuring that its facilities have emergency preparedness programs that meet established requirements and are in place and working. Two methods for doing this include appraisals of field office and contractor programs and review and evaluation of contractor emergency drills. We found that DOE's appraisal program needs improvement and that DOE seldom reviews and evaluates contractor drills.

DOE's Division of Operational and Environmental Safety is supposed to perform periodic appraisals of its field offices to verify that emergency preparedness policies and requirements are appropriately interpreted and implemented. DOE's field offices, in turn, appraise contractor programs.

DOE, however, does not have specific criteria for evaluating emergency preparedness, and consequently has no way to determine whether a particular program is acceptable. DOE officials informed us that they plan to develop planning criteria that is site specific and that will

--provide acceptable criteria for facility emergency plans,

--provide acceptable criteria for State and local emergency planning, and

--serve as a basis for appraising emergency plans.

However, DOE had not yet begun this effort and could not provide a target completion date.

Although DOE officials informed us they place a great deal of emphasis on appraisals to ensure DOE's policies and requirements are being carried out, scheduled appraisals are not always being performed. In addition, there are no specific criteria for how often appraisals should be performed. A DOE official informed us that, generally, field offices appraise contractor programs once every 2 years and headquarters appraises field office programs annually. However, we did not find this to be the case. For example, headquarters did not schedule or perform any appraisals in fiscal year 1979. In fiscal year 1980, headquarters performed 5 of the 11 scheduled appraisals. Although nine are scheduled for fiscal year 1981, none had been performed as of June 23, 1981.

DOE Operations Offices also are not scheduling and performing appraisals of contractor programs. The Albuquerque

Operations Office performed only one contractor appraisal since 1978, and some of Albuquerque's contractor facilities have not been appraised since 1973. The Savannah River Operations Office has not performed any appraisals since 1975, and the Richland Operations Office has appraised only one of its major contractors in the last 2 years.

This limited effort, we believe, clearly demonstrates that DOE places a low priority on emergency preparedness appraisals. In fact, in most cases, DOE officials rely on the contractors to do what is right and do not feel appraisals are very important. For example, Albuquerque officials told us that they believe the contractors' emergency preparedness programs are "pretty good." This belief stems, however, from their confidence in the contractors and not from any oversight activity. This type of confidence appeared to be the prevailing attitude throughout DOE. Contrary to this position, however, we found evidence that raised doubt about the contractors' emergency preparedness program. For example, when Albuquerque appraised one of its contractors in 1973, it found that the emergency preparedness program was fragmented and lacked the centralized coordination required for a comprehensive, integrated program. Albuquerque officials did not appraise this contractor again until 8 years later, at which time they found the contractor still lacked an integrated approach to emergency preparedness.

Even when appraisals have been performed, headquarters and field offices do not always systematically follow up to ensure that deficiencies are corrected. In most cases, followup is performed at the time of the next appraisal, which is generally several years later. In addition, because of DOE's organizational structure, the Division of Operational and Environmental Safety has no authority to enforce its recommendations on field offices. Thus, field offices do not always correct identified deficiencies. For example, the last three headquarters appraisals of the Albuquerque Operations Office revealed that for the last 10 years, Albuquerque was not performing scheduled appraisals of contractor programs. Although each headquarters appraisal recommends that Albuquerque perform scheduled appraisals, this problem still has not been corrected.

Another method of evaluating the effectiveness of contractor emergency preparedness is through reviewing and evaluating emergency drills. These drills serve to identify deficiencies in planning efforts and test employee response to emergencies. Problems found during drills have shown that untested plans are usually ineffective in emergency situations. Thus, it is important that DOE ensure that contractor emergency plans are tested and identified deficiencies are corrected.

Three of the five DOE field offices we reviewed seldom observe and evaluate drills. Sandia Area Office staff only observe facility drills if they happen to be there when the drill occurs; the Rocky Flats Area Office observes only occasionally; and the Savannah River Operations Office has not observed a contractor drill since 1978.

Following facility drills, participants and any independent observers usually critique the drill to determine the degree of success and document deficiencies identified during the drill. At a minimum, we believe that DOE could review these critiques as a substitute for observing drills first hand. We found, however, that most DOE field offices included in our review do not even receive copies of contractor critiques, and only one field office, Richland, receives copies of all critiques.

In any event, whether DOE participates, observes, or simply reviews contractor critiques of emergency drills, little is done to assure identified deficiencies are actually corrected. Only one field office, the Richland Operations Office, follows up to assure corrective actions are taken in a timely manner. None of the other field offices has a system for ensuring deficiencies are corrected.

LIMITED SUPPORT PROVIDED TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA is responsible for formulating Federal emergency preparedness policies and coordinating peacetime and wartime emergency planning and preparedness functions of Executive agencies. Included in its responsibilities for peace-time emergency planning is the responsibility for leading and coordinating emergency response planning for nuclear accidents.

On October 22, 1980, FEMA assigned Federal agencies specific tasks for radiological emergency response planning and preparedness. At this time, DOE was assigned a number of tasks, including

--planning and preparedness for DOE facilities;

--assisting State and local governments in preparing radiological emergency response plans for DOE facilities;

--assisting FEMA in developing planning guidance to State and local governments;

--participating with FEMA in assisting State and local governments in developing their radiological emergency response plans, evaluating exercises to test plans, and reviewing and evaluating the plans and preparedness; and

--providing representation and support for FEMA's Regional Assistance Committees.

FEMA's initial emphasis has been on reviewing and approving State and local emergency plans for areas around commercial nuclear facilities. FEMA relies on the efforts and technical competence of DOE's regional and headquarters personnel to assist in reviewing and preparing State and local emergency plans, and in evaluating exercises to test these plans.

The Secretary of Energy informed the Director of FEMA that DOE was committed to participating in State and local government radiological emergency review activities. However, DOE has not provided the necessary resources to support these activities. Although DOE headquarters directed its field offices to fully support the FEMA program, adequate staffing and travel resources have not been provided to carry out the additional workload. In June 1980, the Under Secretary polled headquarters and field office staff and learned that a total of 12 additional people and $223,000 were needed to meet the Department's commitments to FEMA. To date, these resources have not been provided. As a result, many DOE field offices are not able to fully meet DOE commitments to FEMA. For example, many field offices are unable to provide assistance to FEMA in planning and evaluating exercises to test emergency response planning. In addition, one field office lacks the necessary resources to assist FEMA in reviewing State plans.

DOE has also been slow to respond to planning responsibilities for its own nuclear facilities. On May 28, 1980, FEMA informed DOE that it wanted to begin joint efforts to develop criteria and procedures for reviewing State and local emergency plans around DOE facilities. To start with, FEMA requested a listing of all unclassified DOE facilities where coordinated emergency response actions would involve State and local governments. DOE's response, 3 months later, was to inform FEMA of a contact point who could work with FEMA to designate such facilities. After 9 months, an ad hoc committee is just being formed to respond to FEMA's request.

WEAKNESSES IN EMERGENCY PREPAREDNESS HAVE NOT BEEN CORRECTED

On March 30, 1979, we reported on the status of emergency preparedness around nuclear facilities in a report to the Congress entitled "Areas Around Nuclear Facilities Should Be Better

Prepared for Radiological Emergencies" (EMD-78-110). In our report, we made several recommendations to the Secretary of Energy for correcting weaknesses in DOE's emergency preparedness program. These were:

--To the extent that national security is not jeopardized, require that the people living near nuclear facilities be provided with information about the potential hazard, the emergency actions planned, and what to do in the event of an accidental radiological release.

--Require DOE facility operators to develop formal and explicit agreements with the State and local government agencies having emergency responsibilities. These agreements should clearly delineate the roles, responsibilities, and capabilities of each party in the event of an offsite radiological emergency. They should also include provisions that the State and local emergency response agencies will be encouraged to participate in annual drills with the facilities.

--Require the major nuclear materials production and research reservations under DOE control to perform radiological emergency response drills at least annually. These drills should be comprehensive (site-wide) and should test the emergency-response plans against simulated accident conditions that are realistic.

--Require a periodic, complete headquarters' review of each facility's emergency plan at least every 2 years.

We have re-examined these areas to determine what actions DOE has taken. DOE told the Congress that it agreed with our recommendations, and corrective actions would be taken by headquarters or, where applicable, headquarters would direct field offices to take the action. DOE then assigned follow-on action jointly to three headquarters' organizations--the Assistant Secretaries for Energy Technology, Environment, and Defense Programs. However, we were unable to find documents or instructions from any of these organizations directing DOE field offices to implement the report recommendations.

DOE headquarters' response to our report was to temporarily increase its appraisal effort which, as discussed on pages 19 and 20, is ineffective. Although headquarters officials told us that our report was used as a basis for evaluating field office and contractor emergency preparedness programs, appraisal reports fail to reflect the status of DOE implementation of our recommendations. In addition, we were unable to find any record at DOE headquarters that adequately reflected the status of DOE's implementation.

Even DOE's audit report tracking system failed to adequately document corrective actions taken or planned. This system was designed by DOE to ensure that corrective actions on audit report recommendations are responsive, timely and complete. Audit reports, such as ours, are tracked through the system by the DOE Audit Review Council. This Council receives quarterly reports from the DOE offices responsible for ensuring implementation of the recommendations.

On December 9, 1980, officials from the Office of Assistant Secretary for Environment told the Council that implementation of our recommendations were not complete and pointed out that resource constraints were affecting how much and how quickly actions could be accomplished. They recommended that our report's recommendations remain open so that DOE management could understand the status of radiological emergency preparedness within DOE. Nevertheless, the Council concluded that actions taken or planned were adequate and no further reporting under DOE's audit report tracking system was required.

In an effort to determine the extent of implementation by DOE, we discussed the recommendations with responsible headquarters and field office officials. With one exception, we found that because of the lack of a headquarters' policy directive or guidance of any kind, the field offices have done little to correct these deficiencies. 1/ In addition, we believe that DOE's Audit Review Council prematurely removed our report from its tracking system. The following is a status of the actions DOE has taken to correct weaknesses identified in our report.

--Inform the Public of the Potential Hazards and Protective Measures. Only one facility, the Rocky Flats Plant, has provided the public with information on the potential hazards and what to do in the event of an accidental radiological release. This was developed by the contractor, paid for by DOE, and distributed by the Colorado Division of Disaster Emergency Services. The only other field office to take any action was Richland Operations Office. Richland has drafted a handbook which it plans to issue the end of this fiscal year. The remaining field offices included in our review have not taken any action.

--Develop formal and Explicit Agreements with State and Local Government Agencies. Only two field offices--Richland and Rocky Flats--have written agreements with both State and local government agencies that delineate

---

1/The Richland Operations Office used our report as a basis in upgrading its emergency preparedness program.

the roles and responsibilities of each party during an offsite radiological emergency. At Richland, DOE has signed memorandums of understanding with Washington, Oregon, and Benton County (Wash.). Richland has also developed a site-wide plan and coordinated it with the State and county and has assisted the State and county in developing site-specific portions to their plans. At Rocky Flats, however, the State took the initiative and developed a site-specific plan with Rocky Flat's assistance. The State plan was reviewed and concurred in by the State, counties, DOE, and the contractor operating the facility. In both cases, these plans address the responsibilities of each party during a radiological emergency. The Savannah River Operations Office has an agreement with the State of South Carolina but has no agreements with local government agencies. The remaining field offices only have isolated agreements with certain groups, such as ambulance services or fire departments.

--Encourage State and Local Participation in Facility Drills. Only one facility, the Rocky Flats Plant, has participated in an emergency exercise with State and local agencies. This exercise, however, was held at the State's initiative to test the State's Radiological Emergency Response Plan for Rocky Flats. Richland Operations Office included State and local agencies, but only in communication checks and simulated responses during its site-wide exercise in 1980. Richland officials plan to include actual response by State and local agencies once these agencies complete site-specific emergency procedures. None of the other DOE facilities we reviewed included State and local government agencies in its emergency drills.

--Perform Comprehensive, Simulated Drills Annually. Not all DOE facilities are using simulated accident conditions to test their emergency plans, nor are they conducting comprehensive tests of their plans. Based on the problems found in some plans that have been tested, there is no assurance that an untested, or inadequately tested, plan will work. For example, as the result of an exercise at one facility, it was discovered that 80 percent of the time, DOE's contractor would not be able to accurately determine where contaminated air was moving. This was the facility's first exercise using simulated accident conditions involving offsite releases and State and local participation. Only one facility, Richland's Hanford Reservation, has initiated a site-wide drill under simulated accident conditions. The Rocky Flats Plant participated in a State-initiated drill that involved simulated accident conditions. Drills normally conducted by the Rocky Flats Plant

only involve a single building and are primarily evacuation exercises. Some facilities are performing drills under simulated, accident conditions, although these drills are not site-wide.

--Complete Headquarters Review of Facility Plans. There has been no headquarters action in this area. None of the facility plans have been reviewed by DOE headquarters. Some plans, however, have received detailed reviews by the field offices, while other plans have not been completely reviewed by the field office since 1975.

CONCLUSIONS AND RECOMMENDATIONS

Radiological emergency preparedness has not received sufficient priority in DOE to ensure an adequate level of preparedness for a serious nuclear accident. DOE's emergency preparedness program lacks the coordinated, unified approach necessary to ensure adequate protection at all DOE facilities. Emergency preparedness responsibilities are fragmented, are not clearly defined, and are not always being carried out. In addition, headquarters organizational units with emergency preparedness responsibilities do not always have sufficient authority to carry out assigned responsibilities because of their placement within the organization. As a result, each facility is free to determine its own level of emergency preparedness capability.

Implementation of DOE's emergency preparedness program is nonexistent because, in our opinion, DOE does not have an agency-wide emergency preparedness program. Rather, DOE's emergency preparedness program is based on a cancelled directive issued by DOE's predecessor--ERDA. Implementation of the ERDA program varies from office to office, in some cases going beyond ERDA requirements and in other cases falling short. We believe that after 5 years of existence, DOE should have emergency preparedness policy and criteria.

DOE's efforts for ensuring that emergency preparedness programs are in place and working are ineffective. Appraisals of field office and contractor programs are not always being scheduled or performed. In addition, DOE does little to ensure contractor emergency plans are tested and identified deficiencies are corrected. Thus, DOE is not sure that contractor emergency plans will work when called upon to do so. To ensure that field offices and contractors are appropriately interpreting and implementing DOE emergency preparedness policy and criteria, DOE should perform regular appraisals of field office and contractor implementation and regularly review and evaluate contractor emergency exercises.

DOE has not fulfilled responsibilities assigned to it by FEMA because it has failed to assign sufficient resources.

We believe DOE should support its commitment to FEMA's national effort to upgrade emergency preparedness around nuclear facilities.

Finally, in a previous report, we identified a number of weaknesses in DOE's emergency preparedness program and made several recommendations for correcting these weaknesses. DOE management believes adequate action has been taken or is planned to ensure these weaknesses have been corrected and, thus, has discontinued followup action. On the contrary, although DOE told the Congress it agreed with these recommendations, we found that the Department has done little to correct the deficiencies.

We therefore recommend that the Secretary of Energy:

--Consolidate the policymaking, coordinating, and appraisal functions into one organizational unit. To ensure that this unit has sufficient authority to carry out its responsibilities, it should at least be at a level of authority higher than those units responsible for implementing established policy.

--Expedite the development of DOE emergency preparedness requirements. These requirements should clearly define DOE and contractor responsibilities and should describe specific emergency preparedness criteria. Such criteria should reflect post Three Mile Island lessons learned.

--Establish requirements for annual appraisals of field office and contractor emergency preparedness programs. In addition, the Secretary should require that DOE independently review and evaluate contractor drills on a regular basis.

--Provide the support necessary to carry out responsibilities delegated by FEMA in its national effort to improve emergency preparedness around nuclear facilities.

--Take the necessary steps, as recommended previously, to correct the weaknesses noted in our March 1979 report.

CHAPTER 4

ADDITIONAL EFFORT NEEDED TO ENSURE SAFETY OF DOE'S OLDER NUCLEAR FACILITIES

To ensure that nuclear facilities are designed and constructed safely, DOE conducts an extensive series of reviews prior to the facility's construction and operation. These reviews are similar, in some respects, to the type of review conducted by NRC for commercial nuclear facilities. The majority of DOE's facilities, however, were built before this review system was initiated and before modern nuclear design and construction standards were adopted. Moreover, in the past 4 decades, as more and more is learned about nuclear power, design standards and worker experience standards have become more conservative. Thus, DOE may be operating a number of older nuclear facilities which might not meet today's safety design criteria.

In a June 4, 1976, report to the Administrator of ERDA, we recommended that safety analyses be required for all existing ERDA-owned nuclear facilities. As a result, ERDA began a program to perform a safety analysis of all of its older facilities to determine if they should continue to operate, be modified to improve safety, or be permanently closed. These safety analyses--to be performed by the contractor in charge of operating the facility--are supposed to compare the plant's design with current guides, codes, and standards. More specifically, these safety analyses are supposed to

--systematically identify potential hazards at existing facilities;

--analyze the impact of potential hazards; and

--ensure that reasonable measures to eliminate, control, or mitigate the hazards have been taken.

Although DOE began conducting safety analyses for existing facilities nearly 10 years ago, DOE has not established detailed program guidelines or timeframes for completion. As a result, many facilities still have not been analyzed to determine what hazards exist. In some cases where safety analyses were conducted and reviewed, there is evidence that all potential hazards were not identified and, where potential hazards were identified, no corrective action was taken.

MANY DOE FACILITIES DO NOT HAVE COMPLETED SAFETY ANALYSES

In late 1976, DOE required that safety analyses be performed of its existing nuclear facilities. Prior to that time, these

analyses were performed at the discretion of the individual DOE field offices.

During our review, therefore, we examined the progress made by the operations offices since DOE instituted the agency-wide requirement for safety analyses in 1976. While some progress has been made, we found that, after almost 5 years, some facilities have still not received a safety analysis. Other safety analyses are either in progress but not completed, completed but not reviewed and approved by DOE, or completed and reviewed but in need of updating. The effect of an incomplete safety analysis program is that DOE lacks assurance that (1) potential hazards have been identified; (2) the impacts of the identified hazards have been analyzed; and (3) measures to eliminate, control, or mitigate the hazards have been taken.

We found that safety analyses have not been completed because DOE's safety analysis program lacks priority and is somewhat disorganized. While there is a DOE headquarters office which has some general oversight and reporting responsibilities for the safety analysis program, it has no real authority over the field office operations and thus has had little impact on the overall program. As presently organized, there is no central office in DOE setting time frames, goals, or priorities for performing safety analyses. Instead, each DOE field office is responsible for classifying its hazardous facilities and operations and for establishing priorities and programs for analyzing the safety of its older and potentially hazardous facilities.

For example, 45 high and moderate hazard facilities 1/ under the jurisdiction of the Albuquerque Operations Office still do not have a DOE-approved safety analysis. No information was available on the number of low hazard facilities 2/ because the Albuquerque Operations Office does not require its contractor to perform safety analysis for this classification of facility or operation.

1/"High hazard facilities" refers to those facilities with the potential for major onsite or offsite impacts to people or the environment. Moderate hazard facilities are those which present considerable potential onsite impacts to people or the environment, but at most only minor offsite impacts.

2/Low hazard facilities are those which present minor onsite and negligible offsite impact to people or the environment.

About 25 facilities under the jurisdiction of DOE's Richland Operations Office 1/ either have no DOE-approved safety analysis or require updated analysis.

Although all facilities under the jurisdiction of the Savannah River Operation Office have safety analysis which have been prepared by the operating contractors, about 19 have not been approved by DOE. In February 1981, however, DOE officials projected that, at the current level of effort being committed to the review of safety analyses at Savannah River, it would take 28 years to complete the review and approval of the remaining analyses. This time frame, however, assumed that no additional assignments were made, such as safety analysis updates--to be done every 5 years--and that no new activities requiring a safety analysis were started at Savannah River. DOE safety officials attributed this limited level of effort and resulting backlog to insufficient resources provided the Operations Office Safety Branch for this type of activity. Such a limited level of effort, we believe, further demonstrates the low priority DOE management assigns this effort and is symptomatic of a conflict for staff and resources between safety and program activities.

To remedy this problem, Savannah River Operations Office officials attempted to prioritize work requirements and develop a solution for carrying out the necessary safety analysis reviews. The solution developed and adopted in February 1981 was two fold. First, Operations Office officials increased the level of effort committed to safety analysis reviews from 2.5 staff months per year in fiscal year 1981 to 7 in fiscal year 1982, 9 in fiscal year 83, and 6.5 in fiscal year 1984. Second, the scope of the safety analysis reviews is being reduced from what was performed in the past. Using this approach, Operations Office officials expect to complete all reviews by 1985.

During our review, Savannah River Operations Office officials were in the process of developing guidance for this more limited review. As a result, we did not evaluate the adequacy of this approach.

The impact and cost of not performing safety analyses at all DOE facilities is exemplified by an October 9, 1980, accident at the Hanford reservation. A container of radioactive scrap material ignited and blew apart, releasing radioactive material. This event resulted in exposures to contractor employees as well as contamination of the facility

---

1/Richland Operations Office does not classify facilities by high, moderate, or low hazard.

itself. Releases of radioactive material to the environment were determined to be within DOE standards. This accident is classified at a Type A accident (DOE's most serious accident classification), with an estimated property damage of $654,360.

The committee investigating the accident concluded that a major contributor to the cause of the accident was the failure to identify, evaluate, and acknowledge the potential hazards present in scrap material operations to ensure that appropriate precautions were taken before initating repackaging operations. Although the contractor has previously identified material repackaging and handling activities as an activity needing a safety analysis, an analysis had not been performed. In the investigating committee's opinion, preparation of a safety analysis report may have prevented the accident.

FAILURE TO IDENTIFY AND CORRECT HAZARDS

According to DOE, the primary purpose in conducting a safety analysis is for the contractor to identify hazards which are of the type and magnitude not generally accepted by the public. When such a hazard is identified, the contractor provides an assessment of the probability of that hazard's occurring and a prediction of the consequences if the hazard did occur. The contractor's safety analysis also includes a description of the controls or design features which exist or are required to prevent or mitigate an accident. Although DOE reviews the contractors' safety analysis to ensure accuracy and completeness, our review indicates that safety analyses have not identified all hazards, and neither DOE nor its contractors have taken action to eliminate, mitigate, or control some hazards which have been identified.

Safety analyses do not identify all significant hazards

As part of the safety analysis process, DOE and its operating contractors identify, analyze, and mitigate or eliminate many potential hazards at DOE's nuclear facilities. However, in some cases, significant hazards were not adequately analyzed, and physical design features or administrative controls that could have prevented accidents or mitigated their effects were not provided. Subsequent accidents have caused radiological contamination and damage to the facilities. Decontaminating the facilities and restoring them to usable conditions has been costly.

For example, on March 13, 1979, a plutonium oxide storage container ruptured during its transfer from a shipping canister to a storage location in a building at the Hanford complex. The

inside of the building received extensive contamination, and three employees received minor external radioactive contamination. Property damage was estimated at $725,000. The building, which serves as a storage facility for special nuclear materials, 1/ and the operation involved were included in a safety analysis report which was issued in May 1974.

The team investigating the accident report that some features of the building contributed to the severity of the accident. For example, the building lacked a controlled environmental enclosure to contain contamination from storage containers which may rupture during unpacking. The building also had a poor ventilation system which permitted leaks of contamination to the environment. These items were not addressed in the safety analysis report. The investigating team concluded that a controlled environmental enclosure within the building would have (1) negated the seriousness of the contamination resulting from the accident, (2) reduced significantly the risk to which employees were subjected, and (3) probably would have decreased releases to the environment. The investigation report recommended that the building be upgraded or replaced to ensure adequate contamination control capability and that a complete safety analysis be conducted.

Another example where a safety analysis failed to identify a significant potential hazard occurred at the Hanford complex on August 30, 1976. A chemical explosion contaminated five employees with radioactive americium and resulted in $500,000 in property damage and a small release of radiation to the atmosphere. One of the employees received the largest dose of alpha radiation ever received by a human who survived. The subsequent investigation found that although a safety analysis had been performed, it did not analyze the safety of the process as it was actually operated. The investigation report also states that the safety analysis failed to recognize applicable safety information available in literature at that time.

Although it is not clear why the safety analysis failed to include these specific hazards, including consideration of alternatives which would mitigate or eliminate the hazard, DOE's review of the contractor's analysis should have identified the omissions. A contributing factor to DOE's not identifying the omissions may have been a lack of detailed, technical plant knowledge by DOE officials. A number of contractors and DOE

1/Special nuclear material refers to plutonium-239, uranium-233, uranium containing more than the natural abundance of uranium-235, or any material artifically enriched in any of these substances.

officials stated that DOE reviewers lack technical knowledge to ensure the accuracy and completeness of safety analysis performed by the contractor.

These statements are further reinforced by a DOE study of safety and health at DOE's nuclear reactor facilities. 1/ This study was conducted by a high-level committee of DOE officials, chaired by the Principal Deputy Assistant Secretary for Nuclear Energy. The purpose of the study was to determine the adequacy of DOE's nuclear reactor safety program in view of the Three Mile Island accident. The study stated that the specialized nature of nuclear technology warrants unique, technically qualified management whose nuclear expertise is beyond question in reactor safety overview organizations. However, at DOE headquarters, the study found that the nuclear safety overview technical staff had been reduced from 17 in 1976 to 4, with only 2 possessing significant reactor-related experience. The study concluded that headquarters safety staff lacked the technical resources to perform their duties. The DOE study also found that although technical capability at DOE field offices varied widely, it was generally weak and inadequate. At one field location, a safety analysis report could not be reviewed due to lack of technically capable staff.

Identified hazards are not eliminated or mitigated

If a hazard is identified by a safety analysis, the safety analysis report must contain a description of what procedures or plant design features eliminate, mitigate, or control the hazard. If such procedures or design features are not in place, DOE officials told us that a "cost-benefit, trade-off" analysis is conducted. This analysis is conducted on a case-by-case basis and is not based on any formal procedure or criteria. Factors which are, at times, included are cost, degree of risk, and age of the plant. Any of three decisions may result from the cost-benefit, trade-off analysis, viz.,

--close the plant;

--accept the risk of the hazard without modifying the plant or its operation; or

--mitigate the risk, usually through operational or plant design changes.

1/U.S. Department of Energy, "A Safety Assessment of Department of Energy Nuclear Reactors," March 1981.

To date, DOE has not closed any facilities solely because of hazards identified as part of the safety analysis process. Further, several of DOE's nuclear facilities have been kept in operation without modification, despite hazards identified during the safety analysis process. The criteria not met in most of these cases involves withstanding tornado or seismic damage. Only a few of the facilities not meeting these criteria would, however, result in radioactive releases in excess of allowable standards.

The third possible alternative--mitigate the hazard--has been chosen in many cases. However, in some cases, little action has been taken due to funding problems. When hazard mitigation involves large expenditures, funds must be provided through the budget process. Proposals for funding health and safety projects originate at DOE's operations offices and are reviewed and prioritized by DOE's headquarters Division of Operational and Environmental Safety. The Division of Operational and Environmental Safety has no funds for safety projects and must rely on program offices and DOE management to fund those projects which are given high priority. During DOE's budgetary process, however, many projects are usually eliminated, often including those considered to be of highest safety and health priority. As a result, identified hazards are not always corrected.

For example, a safety analysis report was prepared during 1975 for a plutonium-processing facility at DOE's Mound Laboratory in Miamisburg, Ohio. The report concluded that the plant could continue to operate without hazard to the employees, the public, or the environment, except for the consequences of certain seismic and tornado events. The facility was not designed to withstand an earthquake or a direct tornado strike. While the probability of these events is considered to be small, if they were to occur, the consequences would be very serious. A direct hit by a tornado could result in excessive radiological exposures, fatalities, evacuation of the general public, and damages of over $25 million. While correction of these problems has been requested every fiscal year since 1977, and the Division of Operational and Environmental Safety considers it an extremely high-priority project, it has not yet been funded. When originally proposed, the project was estimated to cost about $1.5 million. Current estimated cost is about $2 million.

CONCLUSIONS AND RECOMMENDATIONS

In our June 1976, report, we identified the need for a uniform and documented system to ensure safe operations, identify unacceptable risks, and implement corrective actions for all nuclear facilities under DOE control. Such a system, we believed, would serve as an effective management tool to help ensure that safety evaluations are consistently and uniformly conducted, that any unacceptable risks are identified and brought to the attention

of senior management, and that prompt decisions could be made on the best way to solve identified problems.

Today, 5 years later, we still see that need for such a system. While DOE's safety analysis program is aimed at fulfilling this need, DOE has been lax in implementing the program. DOE has not issued program directives establishing time frames, goals, or priorities. Program implementation is delegated exclusively to the field offices with virtually no direction. However, the safety analysis program appears to also be receiving low priority at DOE field offices. Safety analysis has not been conducted for numerous DOE high-hazard nuclear facilities. As a result, DOE cannot be aware of all hazards which may exist at their facilities.

In addition, where safety analyses have been performed, the lack of emphasis and staffing shortages have resulted in incomplete analysis; that is, safety analyses which have not identified all hazards which exist. According to DOE, some accidents and hundreds of thousands of dollars in clean-up and damage costs could have been avoided had complete, accurate safety analyses been performed. We believe, DOE headquarters should set (1) clear program requirements to ensure uniform treatment of all facilities and (2) firm target completion dates for safety analyses for existing facilities.

Once a safety analysis is performed and significant hazards are identified, unacceptable risks should be promptly corrected. At locations included in our review, this is not always being done. Projects aimed at correcting identified safety and health hazards are competing with other energy projects for funding and, as a result, the safety projects are not being funded.

When viewed collectively, the problems noted in the safety analysis program highlight the need for organizational changes. We believe the underlying cause of these problems is that, in time of constrained budgets and staffing shortages, safety is often sacrificed to accomodate program activities.

We therefore recommend that the Secretary of Energy:

--Take action to increase safety analysis program staffing and budget to provide the program with the capability to adequately conduct and review safety analyses.

--Establish a target completion date for the safety analysis program and issue specific criteria for conducting safety analysis for existing facilities.

CHAPTER 5

OPPORTUNITIES TO INCREASE RELIABILITY OF RADIOLOGICAL MONITORING PROGRAM

For nearly 30 years, DOE's nuclear facilities have been monitored for radiological releases to the environment. This monitoring has been performed, in part, to determine compliance with applicable radiation protection guides and standards and to assess radiological impacts.

DOE's overall policy on radiological releases is to limit exposures to the public to as small a fraction of the annual dose standard as possible. The operating contractors for DOE's nuclear facilities have generally reported low levels of radiological releases. However, environmental sampling is not conducted uniformly at all DOE nuclear facilities, and DOE is not verifying the accuracy of the data reported by the operating contractor.

RADIOLOGICAL MONITORING COULD BE MORE UNIFORM

The Environmental Protection Agency has overall responsibility for establishing off-site radiation standards. Radiological monitoring at DOE's nuclear facilities must be performed to determine the impacts of facility operations and verify compliance with those standards. DOE--specifically the Office of the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness--is responsible for developing environmental protection policies, requirements, guides, and procedures. As part of this responsibility, ERDA, in March 1977, issued "A Guide for Environmental Radiological Surveillance at ERDA Installations." This guide identifies substances that should be monitored as well as the methodology and frequency that should be used. DOE field offices, however, are not required to follow the guide developed by ERDA and have wide latitude to design their own program.

While most operating contractors monitor air, water, food, milk, vegetation, and soil, not all of the facilities included in our review were monitored for the same substances, using the same methodology, and the same frequency. The differences noted are at least partially attributable to the lack of mandatory requirements. While the differences between DOE facilities, their operation, and environmental conditions do not allow complete uniformity of radiological monitoring programs, the programs should be maintained as uniform as possible to ensure that program standards and requirements are met and to help achieve a comparably high level of monitoring sophistication and reliability.

For example, DOE's manual recommends, at a minimum, weekly sampling of local drinking water sources. Drinking water is one of the principal exposure path ways to humans from water borne radionuclides. At one of the facilities included in our review, however, local drinking water sources are sampled only every 6 months. Differences among DOE's facilities were also noted in monitoring food, milk, vegetation, and air.

DOE IS NOT ALWAYS VERIFYING ACCURACY OF RADIATION DATA

While the primary source of radiological monitoring data for DOE's nuclear facilities is the operating contractor, DOE is not taking advantage of independent information to test the accuracy of the contractor's data. In addition, DOE is not adequately conducting management appraisals to ensure that radiological monitoring is conducted in a manner which ensures reliable accurate data. Instead, DOE is relying almost exclusively on the operating contractor's accurately reporting radiological releases from the plant it is operating. Verification is especially important in the post Three Mile Island accident environment where any major radioactive releases results in public concern.

Independent monitoring data are not compared with contractor data

Although DOE does not independently monitor the environment around its nuclear facilities, State and local agencies collect data which DOE could use to verify the accuracy of environmental data submitted by the operating contractors. At all DOE facilities included in our review, off-site monitoring is provided by State or local agencies. At two locations, however, DOE is not coordinating with local agencies to obtain data for comparison and verification of contractors' reports. For example, the South Carolina Department of Health and Environmental Control maintains two air monitors close to DOE's Savannah River facility. DOE's Savannah River Operations Offices, however, do not obtain the results of the State's monitoring efforts and relies exclusively on the contractor for environmental data.

The situation at DOE's Pantex facility is similar. The Texas State government collects soil and drinking water samples and maintains 10 air monitors in the vicinity of the plant. DOE's Amarillo Area Office does not, however, obtain data from the State to compare with the contractor's data.

In contrast, at DOE's Rocky Flats facility, the Colorado Department of Health maintains at least 25 air and 10 water radiological monitoring stations around the Rocky Flats facility. Over 175 samples are collected and analyzed each month. County agencies do not routinely monitor Rocky Flats, but have taken soil

samples and air samples using the State's equipment. Monthly meetings are held between the contractor and the Colorado Department of Health to discuss and compare the data obtained. The Environmental Protection Agency, DOE, and county representatives are also present at these meetings.

The need to confirm the accuracy of radiological data reported by the contractor is exemplified by an incident relating to the annual environmental report published for DOE's Pantex facility. One of the major purposes of this report is to provide accurate and complete data to notify DOE and the public of the enviornmental protection performance of the contractor. "Substantive errors" were found in the 1979 edition compiled by DOE's operating contractor. DOE did not notice the errors until the Environmental Protection Agency brought them to DOE's attention. The Environmental Protection Agency discovered the errors while comparing the annual report to raw environmental data provided to the Environmental Protection Agency by DOE. DOE received such data from the operating contractor on a routine basis. In this case, DOE had information available in-house to verify the accuracy of the operating contractor's annual report, but did not use it. As a result, an erroneous report was issued.

Need for more appraisal oversight

Enviornmental appraisals are similar to other types of appraisals conducted by DOE's safety and health programs. That is, their purpose is to verify that environmental monitoring programs have been developed, documented, and effectively implemented at DOE contractor-operated facilities. Appraisals are to

--provide management with recommendations, where appropriate, for improvement of program performance and

--determine the adequacy of the regulation or requirements used for achieving policy and national statutory goals.

Although DOE requires that appraisals provide management with timely and reliable information, no specific criteria exists stipulating how often appraisals are to be conducted. The Albuquerque Operations Office is the only office included in our review which appears to be effectively appraising contractors' radiological programs. Albuquerque appraisals are performed annually and all recommendations are reviewed to ensure compliance by the contractor.

In contrast, radiological monitoring appraisals at other locations have not been timely. The Savannah River facility, for example, has not had a radiological monitoring appraisal since July 1978. Savannah River Operations Office officials said that legislatively required environmental duties (such as water pollution programs) have precluded them from overseeing the contractor's radiological montioring activities. Instead, Savannah River has relied on informal contacts, telephone conversations, and accident investigations to monitor the contractor's program. These officials stated that this put DOE in an uncomfortable position of not knowing the exact state of the program, but they had confidence in the contractor's ability to meet DOE standards.

In addition, we found that recommendations made in the Savannah River appraisals conducted prior to 1978 were not formally followed up. DOE officials at Savannah River Operations Office stated that they had a vague idea of the status but could not say when corrective actions began or exactly how much remains to be done.

DOE's Richland Operations Office, responsible for programs at the Hanford reservation, is conducting periodic appraisals of contractor operations. These appraisals, however, appear to be very broad overviews and lack detail. Several contractor officials agreed with this observation and commented that more detailed, intensive reviews by DOE would provide information which would enable the contractors to improve their environmental programs.

CONCLUSIONS AND RECOMMENDATIONS

While DOE's operating contractors are reporting that their operations are conducted well within radiological environmental standards, the program lacks consistency from contractor to contractor and from DOE field office to field office. This is due, at least in part, to a lack of mandatory program requirements from DOE headquarters concerning how to monitor, what to monitor, and how often monitoring should be performed. Uniformity assists in ensuring that program standards and requirements are met, aids in achieving a comparably high level of monitoring sophistication and reliability, and allows comparison of similar operations at different locations.

In addition, DOE relies virtually exclusively on the operating contractor for environmental oversight. Independent data and appraisals can help ensure the accuracy of the contractor's reports. DOE however, is making limited use of these methods of verification. Without such verification, DOE is in a position of relying on the operating contractor to ensure that radiological monitoring data are accurate and complete.

We, therefore, recommend that the Secretary of Energy:

--Direct that radiological monitoring and radiological monitoring oversight (appraisals) requirements be issued for mandatory application to all DOE facilities.

--Develop a coordinated system whereby radiological monitoring data supplied by DOE's operating contractors are verified with State or local government agencies with monitoring capability.

CHAPTER 6

CHANGES IN SAFETY AND HEALTH OVERSIGHT FOR DOE'S NUCLEAR FACILITIES CAN INCREASE INDEPENDENCE AND UNIFORMITY

Historically, DOE's nuclear facilities have maintained a good safety record, in terms of occupational injuries and radiation exposures. However the preceeding four chapters discussed a number of problems noted during our review of DOE's occupational safety, emergency preparedness, facility design safety, and environmental monitoring programs. These problems may be individually correctable, but overall they are indicative of a serious need for major change in DOE's current safety and health oversight program. We believe that to adequately determine what form of oversight should exist, consideration should be given to some of the basic causal factors for the problems noted.

One of the major underlying factors involves DOE's safety and health organization structure. The placement of field safety and health personnel within the operation office structure does not allow for independent oversight. In addition, DOE's headquarters safety and health staff has little authority to ensure that policies are implemented.

A second major factor involves what we perceive to be a conflict within DOE between program activities and health and safety. Competition for staff and other resources appears to exist and, in many cases, safety is considered to be of lower priority.

A third factor which should be considered, although not a direct causal factor for the problems noted, involves the public's perception of the credibility of safety and health oversight at DOE's nuclear facilities. This factor has taken on increased importance in recent years, especially in the time period since the Three Mile Island accident. The credibility of the oversight function is highly dependent, of course, on the public's perception of the independence and authority of the oversight agency or group.

The following sections discuss several options available for improving safety and health oversight of DOE's nuclear facilities, thereby helping to resolve the specific problems noted during our review. These options range from reorganizing the entire safety and health function within DOE to having outside agencies provide safety and health oversight. Between these extremes lie various forms of cooperative oversight involving both DOE and outside, independent agencies.

REORGANIZING DOE TO INCREASE INDEPENDENCE WOULD ALSO ALLOW CONSTANT OVERSIGHT

Organization changes within DOE to provide for additional independence and uniformity is probably the least drastic of the alternatives. The creation of a strong, centralized safety and health program, with direct authority over field safety and health personnel and DOE program offices is essential to provide proper emphasis to the program. To implement this alternative, field safety and health personnel involved in program oversight would have to be placed under the direct responsibility of DOE's Division of Operational and Enviornmental Safety, severing organizational ties with operations office managers. At the same time, DOE's safety and health program would have to be provided with the authority to require program offices' compliance with safety and health standards and policies and with the responsibility to issue consistant guidance. Reorganizing the oversight functions in the Division of Operational and Environmental Safety to a staff organization reporting directly to DOE's Under Secretary would provide such authority.

In our opinion, the greatest advantages to this alternative are the retention of the opportunity for day-to-day safety and health oversight at DOE's nuclear facilities and the maintenance of aspects of the Nation's nuclear weapons program largely within one agency.

While we found major improvements are needed in DOE's oversight program, only DOE has safety and health personnel adjacent to many of the DOE's nuclear facilities. This should permit frequent inspections and offer greater opportunities for day-to-day oversight, advice, and detailed knowledge of facility operation than would periodic inspections by outside agencies. In addition, many DOE nuclear facilities contain classified information or processes. Maintaining safety and health oversight within DOE would have minimal impact on the number of people with knowledge and access to plant layouts, nuclear stockpiles, and other classified information.

The major disadvantage to reorganizing the safety and health oversight function within DOE is that the awkward situation of an agency's regulating itself would still exist. Although reorganization would enhance the independence of DOE's safety and health staff, we believe public perception and confidence in DOE's ability to regulate itself would not substantially change.

The March 1981 report on DOE's study of safety at its nuclear reactors (see p. 33) made recommendations for reorganizing the nuclear reactor overview staff within DOE. The report called for the establishment of an independent safety overview group within DOE, reporting to the Under Secretary, to serve as the main safety surveillance channel from the reactor program to top management. DOE's action plan related to the study calls for establishing a reactor safety organization, but at a division level within DOE. We believe establishment of a new nuclear safety group at the same organization level as the existing safety and health organization will do little to enhance the independence or authority of the safety program for reactors.

OUTSIDE REGULATION OF DOE'S NUCLEAR FACILITIES WOULD GUARANTEE INDEPENDENT OVERSIGHT

All of the concerns we have regarding the lack of independence, insulation, and objectivity of DOE's safety and health program could be remedied if DOE's nuclear facilities were regulated by NRC for radiological matters and OSHA for non-radiological matters. The major advantage to this option is that neither agency has conflicting program interests which would prohibit uniform enforcement of standards and regulations, and objective investigations of complaints and accidents. Additionally, these agencies exist solely as regulators and the public's perception of the quality of safety and health oversight provided for DOE's nuclear facilities would be greatly enhanced.

Disadvantages to NRC/OSHA regulation of DOE's nuclear facilities include a reduction in the potential for day-to-day oversight, and the number of people with access to classified information concerning our Nation's nuclear weapons program would increase. In the short term, these problems could be minimized by (1) transferring the DOE personnel already inspecting DOE's nuclear facilities to NRC and OSHA and/or (2) establishing within these agencies a small group responsible for reviewing only DOE's classified nuclear facilities. In addition, both NRC and OSHA already employ personnel cleared for access to classified DOE information.

A more important drawback to assigning safety and health regulation to NRC and OSHA may be, strangely enough, their total independence and objectivity. Many DOE facilities are critical segments of the Nation's nuclear weapons program. While NRC/OSHA may be in a ideal position to enforce safety standards and impose penalties, they are in a very poor position to assess the impact such enforcement may have on plant production and, in turn, overall national security. DOE, as producer and regulator is in an ideal position to assess the national security implications of safety and health concerns.

COOPERATIVE ARRANGEMENTS MAY PROVIDE PROGRAM IMPROVEMENT IN SPECIFIC AREAS

Several intermediate alternatives to increase program independence and uniformity also exist. NRC and/or OSHA, working with DOE in a cooperative effort (with NRC or OSHA providing oversight on a periodic basis and DOE maintaing day-to-day oversight), would provide general assurance of the overall quality of DOE's program. NRC and DOE, for instance, have cooperated in the past on safety and health concerns at DOE's Fast Flux Test Facility. An arrangement of this nature could be expanded to any or all DOE facilities.

Because such an arrangement would, unlike the other alternatives, involve safety and health staff at as many as three agencies, considerable increases in staffing levels may result from duplicative efforts and coordination. For that reason, cooperative efforts may be most useful under limited circumstances. For example, there appears to be some question concerning the adequacy of DOE's nuclear expertise to adequately conduct its safety analysis review program for existing facilities. This would appear to be an ideal situation to enlist the services of NRC, which has extensive expertise in this area. With adequate preparation and DOE's cooperation, NRC should be able to provide an overall assessment of the adequacy of DOE's nuclear facilities--in terms of current safety criteria--and of the technical quality of DOE's program to conduct safety analyses.

Because cooperative arrangements would not, as was the case with the Fast Flux Test Facility, necessarily be entered into with the full sanction of DOE, DOE's cooperation and compliance with NRC/OSHA recommendations may have to be mandatory to ensure the effective operation of this alternataive.

CONCLUSIONS AND RECOMMENDATIONS

We believe that the specific problems noted in this report warrant immediate corrective aciton. We also believe, however, that the underlying organization problems--indicated by the lack of independence and uniformity occurring throughout the four major program areas--may be, by far, the most serious problem over the long term. Of the three alternatives discussed in this chapter, NRC and OSHA regulation of DOE's nuclear facilities would provide the most program independence, uniformity, and public confidence that DOE's facilities are safely operated. Practical concerns, however--such as clssification, budget limitations, and access to nuclear weapons plants--somewhat mitigate the desirability of this alternative.

The most practical alternative--internal reorganization of DOE--falls short of the NRC/OSHA alternative in terms of guaranteeing program independence, uniformity, and public confidence. Reorganization does, however, have the potential for achieving these desired program qualities. We believe that, as a minimal action, major organizational changes are required within DOE to increase the independence and uniformity of its safety and health oversight program. However, we do not believe that the current action plan to establish a new nuclear safety division will achieve these goals. The new group will be at an organizational level equivalent to that of the current safety and health group, and, as such, will have an equivalent lack of authority and independence in safety and health matters. Therefore, to ensure that DOE's safety and health program receives increased priority within DOE and has sufficient authority to ensure that safety and health standards and goals are met, we recommend that the Secretary of Energy:

--Elevate the oversight aspects of the headquarters safety and health organization to report, as a staff organization, to DOE's Under Secretary. At this organizational level, competition with program offices should not exist and the safety and health organization would have the authority to mandate adherence to policy and standards.

Major changes are also required in the field/headquarters relationship to increase the independence of field safety and health staff. The current organization offers great potential for conflict between programmatic and safety and health activities. Safety and health staff organized under eight autonomous operations offices also inhibits uniform applicaton of safety and health standards and policies. To increase program uniformity and to isolate field safety and health staff from program activities, we recommend that the Secretary of Energy:

--Reorganize those field organizations involved in safety and health oversight to report directly, and exclusively, to the elevated safety and health organization at headquarters.

In addition, we believe that such an elevated safety and health organization should be specifically assigned responsibility for ensuring that the recommendations contained in chapters 2 through 5 of this report are implemented.

MATTERS FOR CONSIDERATION BY THE CONGRESS

Most of the problems noted during our review can be corrected by reorganizing DOE's safety and health program and by implementing specific corrective action. One situation, however, does not appear

to be correctable by these actions, but does seem to be more suited to a cooperative arrangement between NRC and DOE. In the past, DOE's efforts in ensuring the safety of its facilities have not been adequate. Of particular concern are those cases where safety analysis reviews have been conducted, but have failed to identify hazards which exist at the facility. A lack of technical expertise by DOE safety and health staff, acknowledged by DOE officials, may have contributed to the incompleteness of these reviews. As a result, we believe that consideration should be given for an independent technical review of DOE's safety analysis program for nuclear facilities. Although such a review will undoubtedly involve the commitment of additional staff and resources, we believe that the Congress should consider legislation to require NRC to review and evaluate a number and a variety of DOE's nuclear facilities and processes, including detailed review of plant operations, the contractors safety analysis methodology and report, and actions taken to mitigate hazards. This evaluation should also examine the adequacy of DOE's review of the safety analysis document. NRC should report to the Congress on the results of its review and evaluation within 1 year. Suggested legislative language to implement this program appears as appendix I to this report.

APPENDIX I

TEXT OF SUGGESTED AMENDMENTS TO THE ENERGY REORGANIZATION ACT OF 1974

Be it enacted by the Senate and House of Representatives in Congress assembled, that this Act may be cited as the Energy Reorganization Amendments Act of 1981.

Section 2 - Section 202 of the Energy Reorganization Act of 1974, 42 U.S.C. 5842, relating to licensing and regulatory functions of Department of Energy nuclear facilities, is amended

(a) By redesignating Section 202, Section 202(a); and

(b) By adding subsection (b), which reads as follows:

"(b) The Commission shall review and evaluate the implementation of health and safety standards at Department of Energy nuclear facilities, including research and other kinds of reactor waste storage facilities, reprocessing and enrichment plants, and special nuclear fuel depositories. Such a review shall include a detailed examination of plant operations, the Contractor's safety analysis methodology and report, and action taken to mitigate hazards. During its review, the Commission shall examine selected facilities, including those related to weapons development and other military applications of atomic energy. The Commission shall report to the Congress on the results of its review and evaluation within one year from the date of enactment of this Act.

"Notwithstanding any provision of law heretofore or hereinafter enacted, the Secretary of Energy shall fully cooperate with the Commission in its investigations and provide ready access to its facilities and to information necessary to complete its review and evaluation."